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SOVIET CHEMICAL AND BIOLOGICAL RESEARCH

Compilation of Abstracts

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AID Work Assignment No. 50a

(Report No. 2 in this series)

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FOREWORD

This report has been prepared in response to AID Work Assignment 50a. It consists of twenty (20) abstracts of entries requested by contractors from AID Bibliography B-63-52. Bracketed numbers for each abstract refer to the original number in the aforementioned bibliography. Other abstracts will be published at irregular intervals.

TABLE OF CONTENTS

[4]
Ado, A. D., and V. V. Mikhaylov.

Modern views on the pathogenesis of bacterial neurointoxications

Uspekhi sovremennoy biologii, v. 49, no. 3, 1960, 373-387

This view of literature on the question of bacterial neurointoxications shows a definite tendency to explain their mechanism in terms of the specific effect of toxins on the central and peripheral nervous systems. The mechanism of tetanus intoxication is generally regarded as involving the spinal cord segments (Eccles, Curtis) and the central inhibition. In respect to botulism, the new data tend to the view that the toxin affects the motor centers in the spinal cord and the medulla oblangata. This would seem to indicate that the true reason for botulism-caused paralyses is the deactivation of the centers of motor innervation. The functional disturbance of the peripheral innervation is due to the pathogenic effect of botulism toxin on the nervous centers

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(Mikhaylov). This view significantly broadens our understanding of the botulism intoxication mechanism. The experimental data on diphtherial intoxication have been scarce and contradictory. Therefore, the problem of diphtherial intoxication calls for a considerable research effort. So far, the theoretical notions on bacterial intoxications have been in the form of working hypotheses, which have proved to be rather fruitful.

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[16]
Aleksandrov, N. I., et al

Development of aerosol immunization method against typhoid fever and dysentery

Voyenno-meditsinskiy zhurnal, no. 5, 1961, 54-59

A total of 8070 volunteers were exposed to aerosols containing desiccated suspensions of dysenteric and typhoid fever antigens. Comparison of the test group with subcutaneously inoculated controls showed aerosol immunization to be quite effective. No serious cases of post-vaccination reaction were observed in the test group.

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[18]
ABC weapons and countermeasures

Zagreb, izdavackog Poduzeca "Epoha." 1960, 426 p.

The book contains 16 chapters written by different authors and an introduction supplied by Maj. General Rade Bulat. Chapter 1 is devoted to a general survey of the atomic theory. Subsequent chapters deal with the following topics: nuclear reactors (Ch. 2); controlled thermonuclear reactions (Ch. 3); nuclear weapons and explosions (Ch. 4); radiation detection and dosimetry (Ch. 5 and 6); biological effects of radioactive contamination (Ch. 7 and 8); nuclear explosions for peaceful purposes (Ch. 9); bacterial aerosols (Ch. 10); microorganisms and toxins as warfare agents (Ch. 11); medical protection of man and animals against infections (Ch. 12); plant diseases

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and their prevention (Ch. 13); modern chemical weapons (nerve gases) (Ch. 14); technical aspects of defense against chemical weapons (Ch. 15); medical aspects of chemical weapons (Ch. 16).

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[30]
Bogdanova, T. P.

Ozone as a disinfector of water from bacterial spores

Gigiyena i sanitariya, no. 10, 1960, 96-98

Contaminated (10,000 anthracoid spores per 1 ml) water samples were treated with an ozone-oxygen gaseous mixture. The sporicidal effect of ozone was in direct relation to the quantity of ozone used and inversely proportional to the quantity of organic impurities in the water. Attainable concentrations of ozone in various water samples were: 2—5 mg/l in distilled water, 7—14 mg/l in tap water, and 34—52 mg/l in brackish water.

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[31]
Boranenkov, N., and E. Smotritskiy

Combat readiness is the main task

Krasnaya zvezda, 14 February 1960, 2

The VIIth party conference of the Moscow PVO district took place in Moscow. All participants emphasized the need for strengthening the discipline. Among others, the following individuals were present: Marshals S. S. Biryuzov and N. D. Yakovlev, Maj. Gen. Khalipov, and the secretary of the Moscow Party Committee, S. M. Butusov.

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[33]
Borod'ko, S. L., et al

Immunological reaction in individuals after concomitant cutaneous inoculation with plague, tularemia, and brucellosis vaccine

Sbornik nauchnykh rabot elistinskoy protivochumnoy stantsii, vyp. 1. Shakhty, Ministerstvo zdravookhraneniya SSSR. 1959. 205-214

Concomitant inoculation of volunteers with plague, brucellosis, and tularemia vaccines did not produce a sharp generalized reaction. Local reaction was mild. No qualitative differences

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in effects were noted following inoculatation with the appropriate monovalent vaccines, as compared to complex immunization. Similarly, the immunological tests indicated comparable levels of immunity attained after either inoculation method. Standard inoculation doses used in cutaneous inoculations are sufficient to provide adequate immunity in complex vaccination procedures.

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[34]
Borod'ko, S. L., and L. G. Samsonovich

Compatibility of live plague, brucellosis, and anthrax vaccines in guinea pigs

Sbornik nauchnykh rabot elistinskoy protivochumnoy stantsii, vyp. 1. Shakhty, Ministerstvo zdravookhraneniya SSSR, 1959, 193-204

Guinea pigs were inoculated simultaneously with a combination plague brucellosis, tularemia, anthrax, or with plague, tularemia, and anthrax vaccines. Animals vaccinated with the appropriate monovalent vaccines were used as controls. Only moderate local and generalized reactions were observed in the test groups, although in animals inoculated with tulareria vaccine there

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was a stronger post-immunization reaction than in either test on control groups. It is concluded that the tularemia vaccine comprises the most active factor in the mechanism of complex vaccination.

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[36]
Bulatova, I. I., and Ye. A. Kabanova

Identification of botulism agents with luminescent sera

Zhurnal mikrobiologii, epidemiologii i immunobiologii 31 (3):18-22, 1961

The luminescent sera of the globulin fraction of the botulinum antiserum B were prepared according to standard procedures. They were tested in combination with a number of strains of Cl. botulinum A, B, C, D and E; Cl. perfringens A, B, C, D and F; Cl. sporogens; Bac anthracoidesl; and B.

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coli commune. The luminescence was observed in the case of Cl. botulinum B, and in all strains of Cl. botulinum A, while none was noted in Cl. botulinum C and E, Cl. perfringens A, B, C, D, F, B. coli commune, and Bac anthracoidesl. All luminescent strains agglutinated with the botulinum antiserum B; however, there was no correlation between the agglutinnation reaction and the intensity of luminescence.

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[42]
Chertkova, F. A., et al

A standard type E antibotulinum serum

Zhurnal mikrobiologii, epidemiologii i immunobiologii 31 (4):84-87, 1960

The antibotulinum type E serum was obtained by hyperimmunization of horses; in addition, type E botulinum toxin (series 216/2) and type E antibotulinum serum (series 1) were also prepared. The antitoxin unit was defined as 0.03 mgr of dry substance. Standardization of the test doses showed that the minimal lethal doses varied considerably, depending on the strain used. Supplemental studies indicated that type E toxins (series 216/2 and 16/3) were activated by trypsin.

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[45]
Dolodonov, S.

Radiological and chemical reconnaissance

Votennyy vestnik 41(5):50-53, 1961

Nuclear explosions may be a hindrance in effecting the crossing of water obstacles. It is, therefore, a primary function of chemical and radiological (CR) reconnaissance to delineate the contaminated area and to inform the rear echelons on the extent of the radiation danger. To insure the most rapid evaluation of the radiation danger during actual operations it is recommended that one or two CR specialists be attached to the forward echelons on the batallion level. In the author's opinion, such an arrangement would be helpful in effecting a rapid rerouting of the forward combat units toward alternate staging areas. The article includes a map of a typical crossing operation during employment of nuclear weapons.

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[47]
Drankin, D. I., et al

On epidemiology of Br. Suis brucellosis

Zhurnal mikrobiologii, epidemiologii i immunobiologii 31 (2):95-100, 1960

Two brucellosis foci were investigated, and cultures of Br. suis were isolated from pig fetuses. No infection was detected in other domestic animals which had come into direct contact with the infected swine, although 19 of 444 attendants were contaminated.

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[50]
Dudko, K.

At high speeds [activities of the detachment of chemical and radiological reconnaissance]

Voyennyy vestnik, no. 7, 1962, 38-40

Chemico-radiological reconnaissance units in personnel carriers advance ahead of reconnaissance detachments at speeds of 30 km/hour. The vehicles are equipped with a gas warning device and an x-ray counter (switched on every 500 or 1000 meters.) If the terrain is contaminated the information is radioed to the commander of the reconnaissance detachment, a marker is put down, and the nature of the chemical agent determined.

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[55]
Fedorov, Yu. V.

Multiplication of tick-borne encephalitis virus in various tissues of developing chick embryos and the possibility of the practical use of antigens

Voprosy virusologii 1:27-30, 1960

Suspensions of tick-borne encephalitis virus (Sofin strain) were injected in chick embryos 8, 9, and 10 days old. The optimal conditions for viral proliferation were observed following a 72-hour incubation of 8-day embryos. After incubation the highest viral concentrations occurred in the embryos, yolk, and chorio-allontoic membranes, while the lowest concentrations were extracted from amniotic and allontoic fluids. The antigens prepared from the embryos may be used for immunization of animals. Comparison of the immunogenic properties of the prepared vaccines showed that vaccines from the body of the embryos were more effective than those obtained from membranes or embryonic fluids.

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[62]
Grid'ko, N.

Defense against weapons of mass destruction

Voennyy vestnik, no. 5, 1960, 27-28

The author agrees in principle with Col. M. Sergeychuk's views (Voyennyy vestnik, no. 10, 1959) on the proposed countermeasures to be used against weapons of mass destruction. However, it is emphasized that the countermeasures should not interfere with the duties and functions of the infantry company.

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[101]
Klyuzhko, S. D., et al

Bacterial aeroplankton in the upper atmospheric layers during winter

Vrachebnoye delo, no. 1, 1960, 75-76

Air samples were taken in the vicinity of Lvov in March, 1958. On the average there were 658, 196, and 62 microbes per 1 m^3 of air representing respective altitudes of 500, 4000, and 6000 meters. Fifteen kilometers from the city bacteria were less numerous: 324, 168, and 68 microbes were counted in 1 m^3 of air collected at the altitudes mentioned above. In general there was an increase in bacterial count during periods of high relative humidity and at night.

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[112]
Kulakov, A.

Always be alert!

Krasnaya zvezda, 12 February 1960, 2

A Baku PVO district party conference on the combat readiness of air defense units was held. Among the participants were Col. Gen. A. F. Shcheglov, the commander of the Baku Military District Col., Col. Gen. Ye. Ya. Savitskiy (air force), Maj. Gen. N. V. Petnkhov (air force), and V. E. Semichastnyy, secretary of the Central Committee of the Communist Pary of the Azerbaydzhan SSR.

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[151]
Nesterov, V.

Chemical and radiological reconnaissance

Voyennyy vestnik, 41(6):102-105, 1961

The author describes tactical exercise methods used by a CBR unit to assay and to combat the CR agents employed by a hypothetical enemy. The article includes the exercise plan, the operational map, and a list of equipment used.

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[206]
Smorodintsev, A. A.

The fifth Pugwash Conference on biological and chemical warfare

Akademiya nauk SSSR. Vestnik, no. 10, 1960, 60-66

Twenty-six scientists participated in the fifth Pugwash conference as representatives of the following countries: Canada, Denmark, France, India, the USSR, Sweden, the United Kingdom, and the USA. The discussions dealt with questions of the potential danger of chemical and biological weapons.

T. Rosbery (USA) presented a paper on the history of bacteriological warfare.

Akhiwza (India) expressed doubts in respect to the possible military employment of cholera vibrious. In his view new biological and antigenic agents are more promising militarily, especially if the infection occurs through inhalation. The

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potentialities of smallpox infection were also considered.

Van Magus (Denmark) discussed respiratory viruses; Sven Gard (Sweden), enteral viruses; Stocker (England), rickettsioses; and Kaplan (USA), viruses of domesticated animals. It was emphasized that psittacosis, encephalitis, rickettsiosis, herpes B, and Tsutsugamishi fever are most dangerous to man, while hoof and mouth disease, vesicular stomatosis, exanthema, and cocidioimycosis are of equal danger to animals.

Rosbery (USA), A. Smorodintsev (USSR), and Tibault (France) discussed the manufacture, delivery methods, and storage of bacteriological weapons.

A. Lvov (France) directed the attention of the participants to the considerable potentialities for enhancing the viral and bacterial virulence by means of transformation and transduction techniques. Kaplan (USA) hypothesized that the outbreak of Asiatic influenza in 1957 was due to a new viral strain escaping from the confines of the laboratory. Dubinin (USSR) stated that zarin (isopropylmethylfluorophosphate) and zoman, if delivered in a 10-ton warhead, could be lethal

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over a territory of lo square kilometers. Lijk (USA) regards as highly unlikely the employment of lysorgic acid derivatives.

The participants agreed that:

1. All powers should ratify the Geneva agreement of 1925.
2. It would be highly desirable to eliminate the secrecy surrounding the development of chemical and biological weapons.
3. The greatest possible publicity should be used when cases of the actual use of chemical and biological weapons are reported.

The participants were unanimous in their view that only a total prohibition of war can be regarded as a sufficient guarantee that no nuclear, chemical, or biological weapons will be used in the future.

[Note: In the Russian source all foreign names are given in Russian transcription. It is therefore very likely that the English transliterations are incorrect.]

Card 3/3

[244]
Vlodavets, V. V.

Some colloidal-chemical properties of bacterial aerosols

Voyenno-meditsinkiy zhurnal (3):82-84. March 1960

Colloidal and particulate phases of Staphylococcal aerosols and their properties were assayed under various conditions. In an atmosphere with a low relative humidity the viability of the bacterial culture was retained for longer periods than when the relative humidity was high, although the precipitation rate of the particulate phase was highest in very humid air. Additional experiments involving natural microflora have shown that the ratio of positive-negative electrical charges of airborne bacteria was 5:4.

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[277]

Zutic, S.

Some elements of employment of ABC weapons and countermeasures in naval warfare

Mornaricki glasnik, v. 10, no. 5, 1960, 541-563. JPRS:9766

In naval warfare one should consider not only types of weapons and their destructive power but also the nature of the target. In the case of an atomic explosion, the explosive power of a nuclear warhead, as well as orthographic, hydrographic, and meteoreological features should be considered. The tactical employment of bacteriological weapons is regarded as being impractical. The advent of nuclear weapons undoubtedly will change fundamentally the nature of amphibious operations. It is likely that such operations will involve larger areas and smaller independent groups of surface craft supplemented by airborne operations.

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